

What is claimed is:

1. A lithium ion secondary battery comprising a positive electrode, a negative electrode and a solid electrolyte, said solid electrolyte being made in the form of a thin film comprising a lithium ion conductive inorganic substance.
2. A lithium ion secondary battery as defined in claim 1 wherein said thin film solid electrolyte has thickness of $20\mu\text{m}$ or below.
3. A lithium ion secondary battery as defined in claim 1 wherein said thin film solid electrolyte is formed directly on an electrode material or materials for the positive electrode and/or the negative electrode.
4. A lithium ion secondary battery as defined in claim 1 wherein said thin film solid electrolyte has lithium ion conductivity of 10^{-5}Scm^{-1} or over.
5. A lithium ion secondary battery as defined in claim 1 wherein said thin film solid electrolyte comprises the inorganic substance in an amount of 40 weight % or over.
6. A lithium ion secondary battery as defined in claim 1 wherein said inorganic substance is a lithium ion conductive crystal.
7. A lithium ion secondary battery as defined in claim 1 wherein said inorganic substance is a lithium ion conductive glass.
8. A lithium ion secondary battery as defined in claim 1 wherein said inorganic substance is a lithium ion conductive glass-ceramic.

9. A lithium ion secondary battery as defined in claim 1 wherein said inorganic substance is powder of the inorganic substance.

10. A lithium ion secondary battery as defined in claim 9 wherein said inorganic substance powder is powder of a lithium ion conductive glass-ceramic.

11. A lithium ion secondary battery as defined in claim 9 wherein an average particle diameter of the inorganic substance powder is $1.0\ \mu\text{m}$ or below.

12. A lithium ion secondary battery as defined in claim 9 wherein said thin film solid electrolyte comprises a lithium ion conductive inorganic substance powder in a polymer medium.

13. A lithium ion secondary battery as defined in claim 9 wherein said thin film solid electrolyte comprises a lithium inorganic salt and lithium ion conductive glass-ceramic powder in a polymer medium.

14. A lithium ion secondary battery as defined in claim 3 wherein said thin film solid electrolyte is formed by direct coating on an electrode material or materials for the positive electrode and/or the negative electrode.

15. A lithium ion secondary battery as defined in claim 3 wherein said thin film solid electrolyte is formed by crystallizing an amorphous layer which is formed by direct coating on an electrode material or materials for the positive electrode and/or the negative electrode.

16. A lithium ion secondary battery as defined in claim 1 comprising a positive electrode, a negative electrode and a solid electrolyte wherein said positive and/or negative electrode comprises lithium ion conductive inorganic substance powder.

17. A lithium ion secondary battery as defined in claim 16 wherein said inorganic substance powder in the positive and/or negative electrode has an average particle diameter of 3 μm or below.

18. A method for manufacturing a lithium ion secondary battery having a thin film solid electrolyte comprising a lithium ion conductive inorganic substance comprising a step of forming the thin film solid electrolyte by coating the lithium ion conductive inorganic substance directly on an electrode material or materials for the positive and/or negative electrode.

19. A method for manufacturing a lithium ion secondary battery as defined in claim 18 comprising a step of preparing slurry comprising the lithium ion conductive inorganic substance, and a step of forming the thin film solid electrolyte by coating the slurry directly on the electrode material or materials for the positive and/or negative electrode.

20. A method for manufacturing a lithium ion secondary battery as defined in claim 18 comprising a step of coating the lithium ion conductive inorganic substance directly on the electrode material or materials for the positive and/or negative electrode to form an amorphous layer, and a step of forming the thin film solid electrolyte by crystallizing the amorphous layer.